

20 January 2003
Application No.: 09/648,413
Docket: 1002.02

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installing a reference source lens on the optical bench for improving collimation of the reference signal;
installing a combining filter on the optical bench that inserts the reference signal into a beam path of the optical signal prior to filtering by the tunable filter; and
installing an optical signal lens between the combining filter and the tunable filter to couple the reference signal and the optical signal into the tunable filter.

Remarks:

Claims 1-22 are pending in this application. Claims 1 and 10 have been amended in various particulars. New claims 19 through 22 have been added to alternatively define the invention.

Claims 1, 4, 5, 7, 8, 10, 13, and 15 continue to be rejected under 35 U.S.C. § 103 as being unpatentable over the Alavie, *et al.* patent (Alavie patent), in view of the Abeles patent. In a related rejection, claims 6 and 14 were rejected in further view of the Obhi, *et al.* patent. Claims 9 and 16 were rejected in further view of the Risk, *et al.* patent. Claims 2, 3, 11, and 12 were rejected in further view of the Weber, *et al.* patent. Finally, claims 17 and 18 were rejected in further view of the Hirabayashi patent. These rejections are respectfully traversed for the following reasons.

The present invention is directed to an integrated optical monitoring system. It is notable in that an optical bench is installed within a package. A tunable filter and detector are further installed on this same bench.

In a somewhat similar vein, claim 10 is directed to a method for constructing an integrated optical monitoring system. The optical bench is installed within the package. A tunable filter and a detector are installed together on the bench.

The co-location of the tunable filter and detector on the bench distinguishes the present claimed invention from the prior art.

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In the past, tunable filters have been installed in double pigtailed hermetic modules. An input fiber enters through one feedthrough to couple the optical signal to the tunable filter, and then a second fiber carries the signal that is transmitted through the tunable filter out of the module to a detector, which is typically located in another module.

None of the applied references shows or suggests the integration of the tunable filter with a detector in a single package on an optical bench. None of the references shows or suggests how such integration could be achieved or whether it would be desirable.

The pending Office Action does not point to this feature in the applied references. At one point, the Office action takes the position that the optical bench not a bench but "the plane where all the limitations are laid on." It seems unfair to revise the applicants' claims to something they are not. The Applicants claim a bench not a plane.

The Office Action then states that there has been a failure to establish that "the optical bench of the present invention [is] any different than the optical bench of the prior art". This is true but not relevant to patentability in this case for two reasons. First, none of the applied references shows a bench that analogous to the claimed bench, and secondly, the invention is not only the optical bench but a system in which the detector and filter are installed in common on the bench.

For this reasons, Applicants believe that the rejection should be withdrawn.

Attached hereto is a marked-up version of the changes made to the specification by the instant amendments. The attached five page appendix is captioned "Version with Markings to Show Changes Made." Please note that due to the amendments, the page and line numbers may be different from the specification as originally filed. Please further note that the page and line numbers hereinabove are relative to the original specification.

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Applicants believe that the present application is in condition for allowance. A Notice of Allowance is respectfully solicited. Should any questions arise, the Examiner is encouraged to contact the undersigned.

Respectfully submitted,

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Date: 20 January 2003

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CLAIMS

What is claimed is:

- 5 1. (amended) An integrated optical monitoring system, comprising:
 a ~~hermetic~~ package;
 an optical bench sealed within the package;
 a fiber pigtail ~~for transmitting an optical signal to the package entering the package~~
 ~~via a fiber feed-through to connect to the bench and terminate above the bench;~~
10 a tunable filter, connected to a top of the bench, that filters ~~an~~ the optical signal
 supplied by the fiber pigtail; and
 a detector connected to the bench that detects the filtered optical signal from the
 tunable filter.
- 15 2. An optical monitoring system as claimed in claim 1, further comprising an isolator
 for suppressing back reflections into the fiber pigtail.
3. An optical monitoring system as claimed in claim 1, further comprising an isolator
 installed on the optical bench for suppressing back reflections into the fiber pigtail.
4. An optical monitoring system as claimed in claim 1, further comprising a reference
 signal source that generates a reference signal that is filtered by the tunable filter.
- 20 5. An optical monitoring system as claimed in claim 1, further comprising a reference
 signal source, installed on the optical bench, which generates a reference signal that is
 filtered by the tunable filter.
6. An optical monitoring system as claimed in claim 5, wherein the reference signal
 source comprises:

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a broadband source; and

an etalon that generates a reference signal with stable spectral characteristics from
broadband signal from the broadband source.

7. (amended) An optical monitoring system as claimed in claim 1, further
5 comprising:

a reference signal source, installed on the optical bench, that generates a reference
signal that is filtered by the tunable filter; and

a reference signal sensor that detects the reference signal which has been filtered by
the tunable filter.

10 8. An optical monitoring system as claimed in claim 1, wherein the optical bench is
smaller than 0.75 inches by 0.5 inches.

9. (amended) An optical monitoring system as claimed in claim 1, further
comprising:

15 a reference signal source, installed on the optical bench, that generates the reference
signal;

a collimating lens, installed on the optical bench, for improving the collimation of
the reference signal;

a combining filter, installed on the optical bench, that inserts the reference signal
into a beam path of optical signal prior to filtering by the tunable filter;

20 a separation filter, installed on the optical bench, that separates the reference signal
from the optical signal, post filtering by the tunable filter; and

a reference signal sensor, installed on the optical bench, that detects the reference
signal from the separation filter.

25 10. (twice amended) A method for constructing an integrated optical monitoring
system, comprising:

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- installing an optical bench in a hermetic package;
~~inserting~~ connecting a fiber pigtail ~~through a fiber feed-through, into to~~ the package
to provide an optical signal;
~~connecting an end of the fiber pigtail to the bench;~~
5 installing a tunable filter on a top of the bench to filter ~~an~~ the optical signal from the
fiber pigtail; and
installing a detector on the bench to detect the filtered optical signal from the
tunable filter.
11. A method as claimed in claim 10, further comprising installing an isolator on the
10 bench to suppress back reflections into the fiber pigtail.
12. A method as claimed in claim 11, further comprising:
generating a reference signal; and
filtering the reference signal with the tunable filter.
13. A method as claimed in claim 10, further comprising:
15 installing a reference signal source on the optical bench; and
installing a combining filter on the optical bench to insert a reference signal from
the reference source into a beam path of the optical signal.
14. A method as claimed in claim 13, wherein the step of installing the reference
signal source comprises:
20 installing a broadband source; and
installing etalon that converts emissions from the broadband source into a reference
signal with stable spectral characteristics.
15. A method as claimed in claim 10, wherein the optical bench is smaller than 0.75
inches by 0.5 inches.

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16. A method as claimed in claim 10, further comprising:
installing a reference signal source on the optical bench;
installing a collimating lens on the optical bench for improving collimation of the
reference signal;
5 installing a combining filter on the optical bench that inserts the reference signal
into a beam path of the optical signal prior to filtering by the tunable filter; and
installing a separation filter on the optical bench that separates the reference signal
from the optical signal post filtering by the tunable filter.
17. (new) A method as claimed in claim 10, further comprising installing a lens
10 optically between the fiber pigtail and the tunable filter on the bench to couple the
optical signal into the tunable filter.
18. (new) An optical monitoring system as claimed in claim 1, further comprising a
lens installed optically between the fiber pigtail and the tunable filter on the bench for
coupling the optical signal into the tunable filter.
- 15 19. (new) An optical monitoring system as claimed in claim 1, wherein the fiber
pigtail enters the package via a fiber feed-through to connect to the bench and
terminate above the bench.
20. (new) An optical monitoring system as claimed in claim 1, wherein the package is
hermetic.
- 20 21. (new) An optical monitoring system as claimed in claim 1, further comprising:
a reference signal source, installed on the optical bench, that generates the reference
signal;
a reference source lens, installed on the optical bench, for improving the
collimation of the reference signal;

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a combining filter, installed on the optical bench, that inserts the reference signal into a beam path of optical signal prior to filtering by the tunable filter; and at least one optical signal lens in the beam path of the optical signal for coupling the reference signal and the optical signal into the tunable filter.

5 22. (new) A method as claimed in claim 10, further comprising:

installing a reference signal source on the optical bench;

installing a reference source lens on the optical bench for improving collimation of the reference signal;

installing a combining filter on the optical bench that inserts the reference signal

10 into a beam path of the optical signal prior to filtering by the tunable filter; and installing an optical signal lens between the combining filter and the tunable filter to couple the reference signal and the optical signal into the tunable filter.